

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

To:

see form PCT/ISA/220

### WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/GB2004/003425

International filing date (day/month/year)  
06.08.2004

Priority date (day/month/year)  
08.08.2003

International Patent Classification (IPC) or both national classification and IPC  
H01M10/36, H01M6/18, H01G9/04, H01M4/62, H01M4/02, H01M10/40

Applicant  
LEXCEL TECHNOLOGY LIMITED

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl  
Fax: +31 70 340 - 3016

Authorized Officer

Gamez, A

Telephone No. +31 70 340-4469



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**International application No.  
PCT/GB2004/003425

IAP20 REG'D RECEIVED 26 JAN 2006

**Box No. I Basis of the opinion**

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2004/003425

---

**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

**1. Statement**

Novelty (N)	Yes: Claims	5-10
	No: Claims	1-4,11-14
Inventive step (IS)	Yes: Claims	5-10
	No: Claims	1-4,11-,14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

---

**Box No. VIII Certain observations on the international application**

---

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/GB2004/003425

**Re Item V.**

**1 Reference is made to the following documents:**

D1 : EP 1 143 549 A (SONY CORPORATION) 10 October 2001 (2001-10-10)

D2 : WO 95/34920 A (LEXCEL TECHNOLOGY LIMITED; GILMOUR, ALEXANDER)  
21 December 1995 (1995-12-21)

D3 : GB 2 335 073 A (\* LEXCEL TECHNOLOGY LTD) 8 September 1999 (1999-09-08)

**2 INDEPENDENT CLAIM 1**

**2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.**

Document D1 discloses (the references in parentheses applying to this document): a secondary battery with a positive electrode comprising a metallic oxide or lithium composite oxide as  $\text{LiMnO}_4$  or  $\text{LiCoO}_2$  and lithium carbonate that can generate in situ  $\text{CO}_2$  (p4, paragraph 27, p15, paragraph 118-131). A solid composite polymer film (polyacrylonitrile) with incorporation of a lithium salt can be used (p16, paragraph 131, p5, paragraph 34-35).

**3 DEPENDENT CLAIMS 2-4, 11-14**

Dependent claims 2-4, 11-14 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).

**4 DEPENDENT CLAIMS 5-10**

The combination of the features of dependent claims 5-10 are neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

D2 discloses a positive electrode used in a secondary lithium battery comprising a transition metal oxide and lithium sulfite or lithium dithionate or lithium dithionite to be

used with a solid separator (p2, p3, p4) and liquid organic solvent based electrolytes. Contrary to the invention, The lithium sulfite or dithionate or dithionite acts as a cathode material with reaction between the sulfur trioxide for example formed after charging with the transition metal oxide.

D3 discloses a positive electrode composition comprising polymer with imine functionality and  $\text{Li}_2\text{SO}_3$ . After charging  $\text{SO}_3$  is formed and immobilised in the polymer network. The battery including this electrode comprise also solid polymer electrolyte with lithium salt. There is no mention of a specific solid composite polymer film with basic functional groups acting as separator.

**Re Item VIII.**

1. Claim 1 is not supported by the description as required by Article 6 PCT, as its scope is broader than justified by the description and drawings. The reasons therefor are the following: the examples disclosed sulphur compounds with alkali or alkaline earth metal. The generalisation could be extended to the non-metallic element claimed in claim 3 but it's not obvious that the invention will work with other non-metallic element.

2. It is clear from the description on pages 1,3,4 that the following feature is essential to the definition of the invention:

(1) absence of organic solvents in the electrochemical cell

Since independent claim 1 does not contain this feature and as comprising is not restrictive, it does not meet the requirement following from Article 6 PCT taken in combination with Rule 6.3(b) PCT that any independent claim must contain all the technical features essential to the definition of the invention.